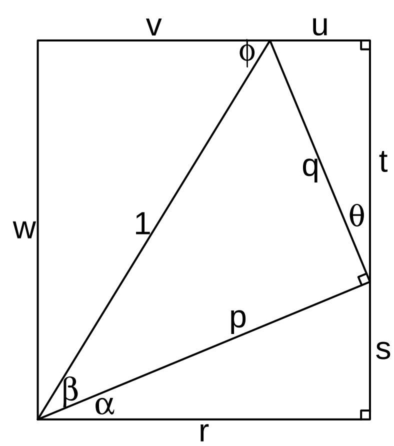
Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(210^\circ) = \frac{-1}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(210^\circ) = \frac{-\sqrt{3}}{2}$$

Determine $\cos(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

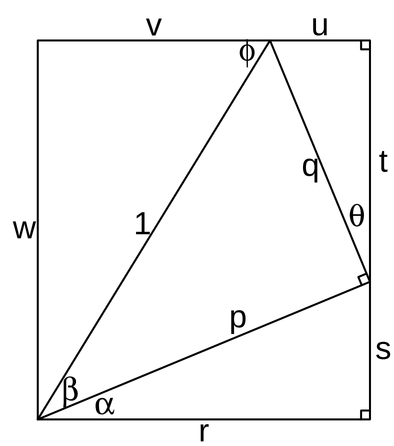
Question 6

Given $\cos(46°) \approx 0.69$, what is $\cos(23°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $46/2 = 23$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
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$q =$	
$r =$	
$s =$	
$\theta =$	
$t =$	
$u =$	
$\phi =$	
$v =$	
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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(120^\circ) = \frac{\sqrt{3}}{2} \qquad \sin(135^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(120^\circ) = \frac{-1}{2} \qquad \cos(135^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\cos(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

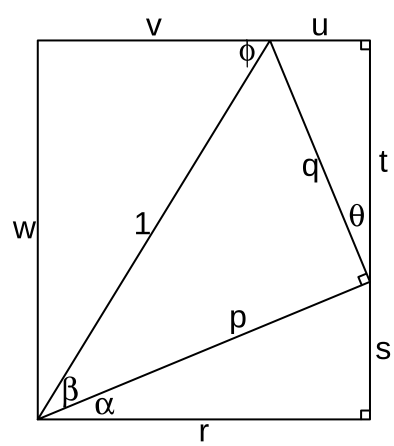
Question 6

Given $\cos(56°) \approx 0.56$, what is $\cos(28°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $56/2 = 28$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
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r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(300^\circ) = \frac{-\sqrt{3}}{2} \qquad \sin(315^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(300^\circ) = \frac{1}{2} \qquad \cos(315^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\sin(-15^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

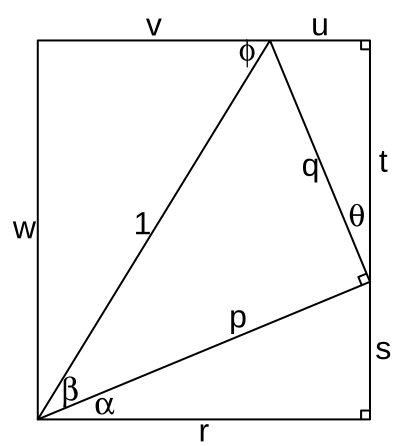
Question 6

Given $\cos(112°) \approx -0.37$, what is $\cos(56°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $112/2 = 56$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
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$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(120^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(120^\circ) = \frac{-1}{2}$$

Determine $\cos(-105^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

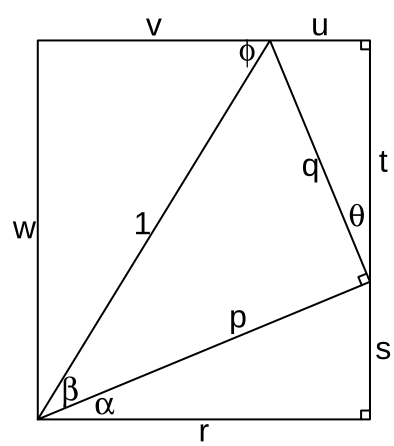
Question 6

Given $\cos(124°) \approx -0.56$, what is $\cos(62°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $124/2 = 62$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



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t =	
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w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(120^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(120^\circ) = \frac{-1}{2}$$

Determine $\sin(165^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

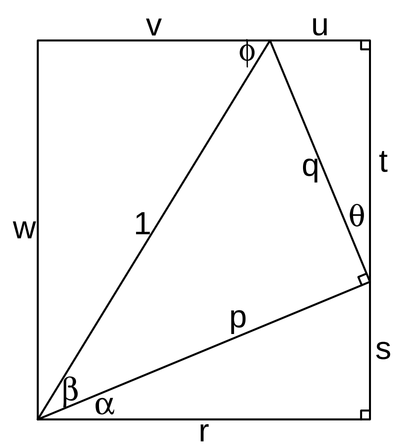
Question 6

Given $\cos(76°) \approx 0.24$, what is $\cos(38°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $76/2 = 38$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
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t =	
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v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(210^\circ) = \frac{-1}{2} \qquad \sin(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(210^\circ) = \frac{-\sqrt{3}}{2} \qquad \cos(45^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\sin(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

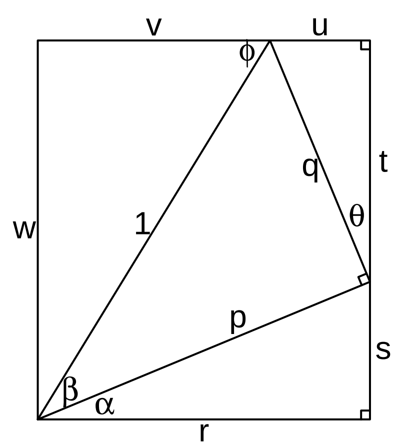
Question 6

Given $\cos(116°) \approx -0.44$, what is $\cos(58°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $116/2 = 58$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(135°) = \frac{\sqrt{2}}{2} \qquad \sin(150°) = \frac{1}{2}$$

$$\cos(135°) = \frac{-\sqrt{2}}{2} \qquad \cos(150°) = \frac{-\sqrt{3}}{2}$$

Determine $\cos(285°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

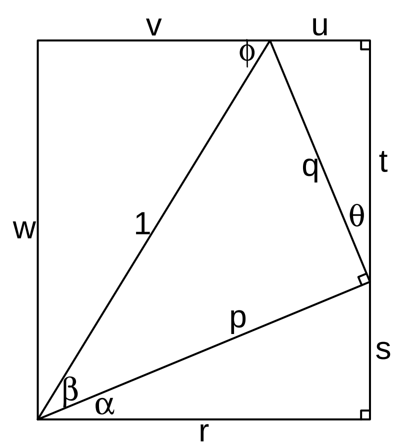
Question 6

Given $\cos(136°) \approx -0.72$, what is $\cos(68°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $136/2 = 68$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(300^\circ) = \frac{-\sqrt{3}}{2} \qquad \sin(315^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(300^\circ) = \frac{1}{2} \qquad \cos(315^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\cos(615^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

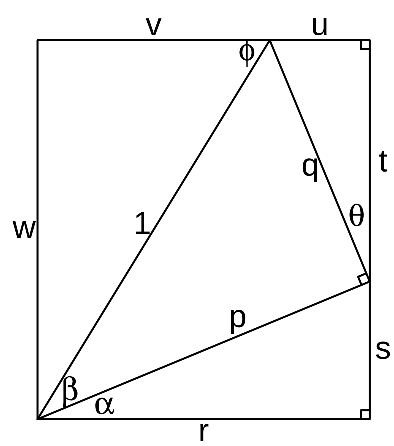
Question 6

Given $\cos(54°) \approx 0.59$, what is $\cos(27°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $54/2 = 27$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}
\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\
\cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)
\end{aligned}$$

You know the following:

$$\sin(240^\circ) = \frac{-\sqrt{3}}{2} \qquad \sin(315^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(240^\circ) = \frac{-1}{2} \qquad \cos(315^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\sin(-75^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

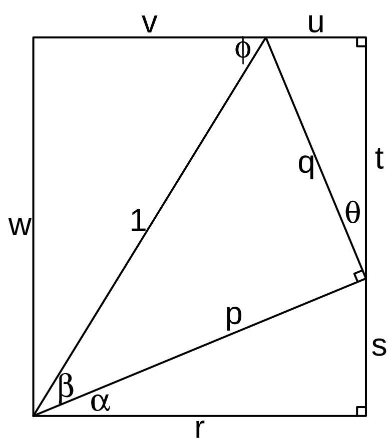
Question 6

Given $\cos(28°) \approx 0.88$, what is $\cos(14°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $28/2 = 14$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



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$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(120°) = \frac{\sqrt{3}}{2} \qquad \sin(315°) = \frac{-\sqrt{2}}{2}$$

$$\cos(120°) = \frac{-1}{2} \qquad \cos(315°) = \frac{\sqrt{2}}{2}$$

Determine $\cos(435°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

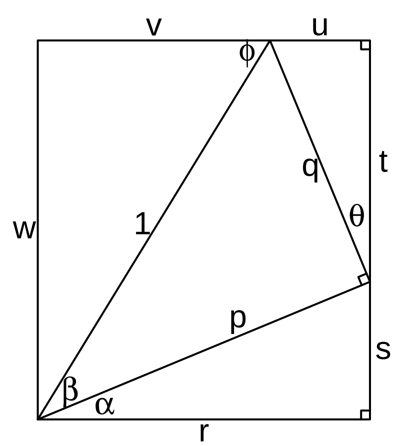
Question 6

Given $\cos(92°) \approx -0.03$, what is $\cos(46°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $92/2 = 46$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(135^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(120^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(135^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(120^\circ) = \frac{-1}{2}$$

Determine $\sin(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

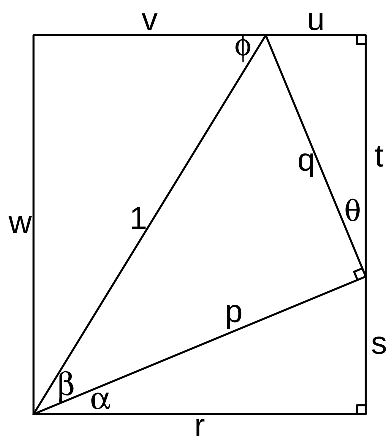
Question 6

Given $\cos(66°) \approx 0.41$, what is $\cos(33°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $66/2 = 33$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(240^\circ) = \frac{-\sqrt{3}}{2}$$

$$\cos(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(240^\circ) = \frac{-1}{2}$$

Determine $\sin(15^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

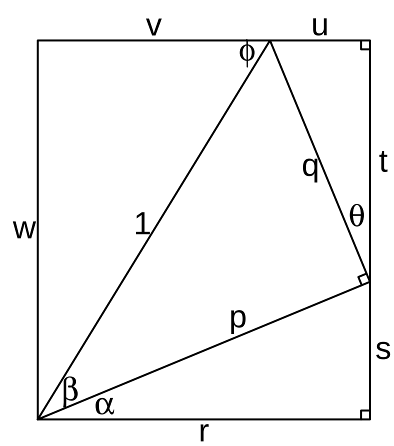
Question 6

Given $\cos(80^\circ) \approx 0.17$, what is $\cos(40^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $80/2 = 40$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(150^\circ) = \frac{1}{2} \qquad \sin(225^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(150^\circ) = \frac{-\sqrt{3}}{2} \qquad \cos(225^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(75^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

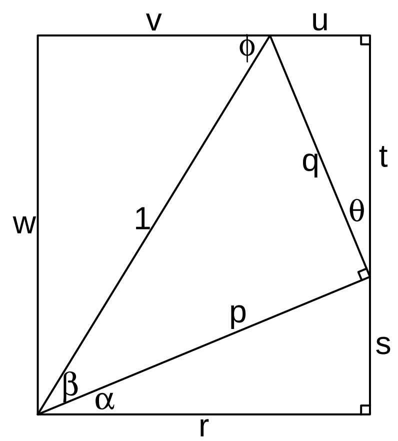
Question 6

Given $\cos(56^\circ) \approx 0.56$, what is $\cos(28^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $56/2 = 28$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(30^\circ) = \frac{1}{2}$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(30^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\cos(-285^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

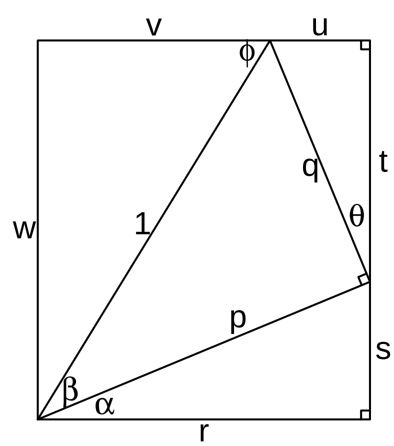
Question 6

Given $\cos(108^\circ) \approx -0.31$, what is $\cos(54^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $108/2 = 54$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(150°) = \frac{1}{2} \qquad \sin(315°) = \frac{-\sqrt{2}}{2}$$

$$\cos(150°) = \frac{-\sqrt{3}}{2} \qquad \cos(315°) = \frac{\sqrt{2}}{2}$$

Determine $\cos(465°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

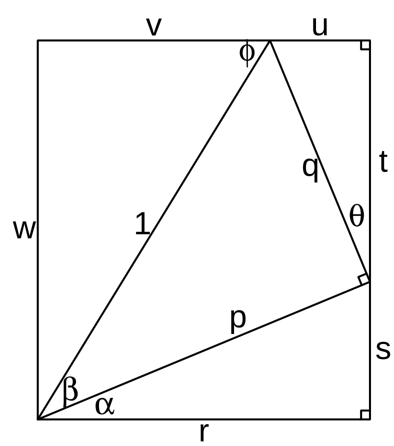
Question 6

Given $\cos(46°) \approx 0.69$, what is $\cos(23°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $46/2 = 23$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(30^\circ) = \frac{1}{2}$$

$$\cos(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(30^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\cos(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

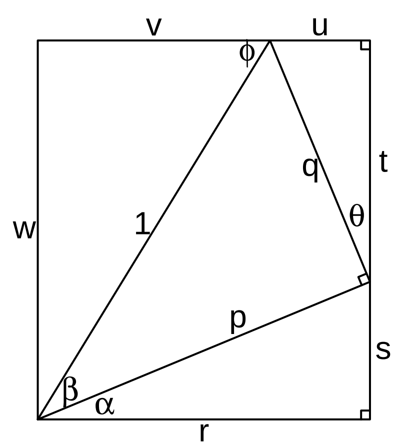
Question 6

Given $\cos(82°) \approx 0.14$, what is $\cos(41°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $82/2 = 41$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(330^\circ) = \frac{-1}{2}$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(330^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\sin(645^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

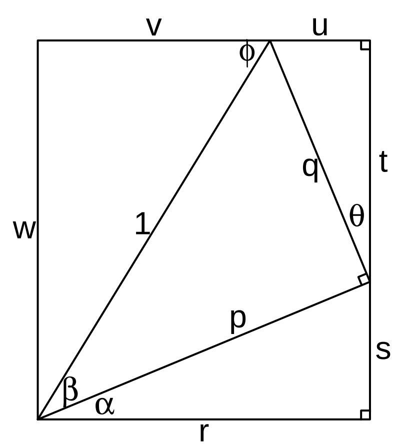
Question 6

Given $\cos(152°) \approx -0.88$, what is $\cos(76°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $152/2 = 76$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(330^\circ) = \frac{-1}{2} \qquad \sin(135^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(330^\circ) = \frac{\sqrt{3}}{2} \qquad \cos(135^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(-195^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

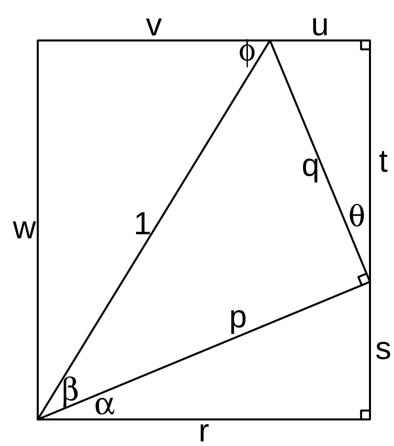
Question 6

Given $\cos(148°) \approx -0.85$, what is $\cos(74°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $148/2 = 74$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(300°) = \frac{-\sqrt{3}}{2} \qquad \sin(45°) = \frac{\sqrt{2}}{2}$$

$$\cos(300°) = \frac{1}{2} \qquad \cos(45°) = \frac{\sqrt{2}}{2}$$

Determine $\sin(345°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

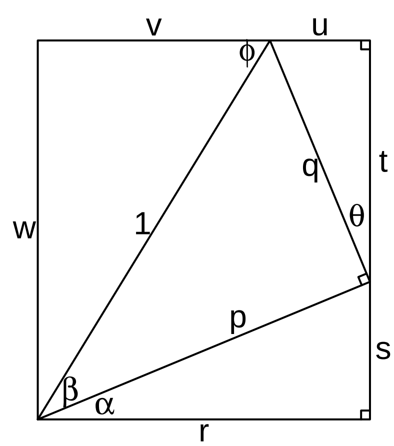
Question 6

Given $\cos(68°) \approx 0.37$, what is $\cos(34°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $68/2 = 34$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(30°) = \frac{1}{2} \qquad \sin(315°) = \frac{-\sqrt{2}}{2}$$

$$\cos(30°) = \frac{\sqrt{3}}{2} \qquad \cos(315°) = \frac{\sqrt{2}}{2}$$

Determine $\cos(345°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

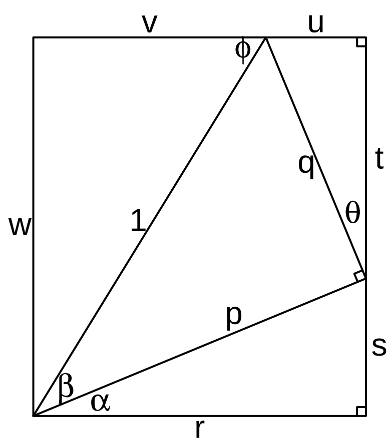
Question 6

Given $\cos(44°) \approx 0.72$, what is $\cos(22°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $44/2 = 22$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(135°) = \frac{\sqrt{2}}{2} \qquad \sin(330°) = \frac{-1}{2}$$

$$\cos(135°) = \frac{-\sqrt{2}}{2} \qquad \cos(330°) = \frac{\sqrt{3}}{2}$$

Determine $\sin(465°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

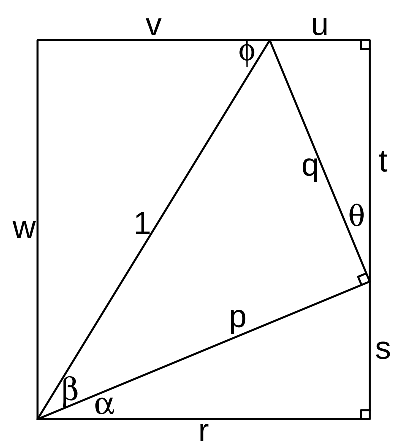
Question 6

Given $\cos(168^\circ) \approx -0.98$, what is $\cos(84^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $168/2 = 84$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(150^\circ) = \frac{1}{2}$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(150^\circ) = \frac{-\sqrt{3}}{2}$$

Determine $\cos(-165^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

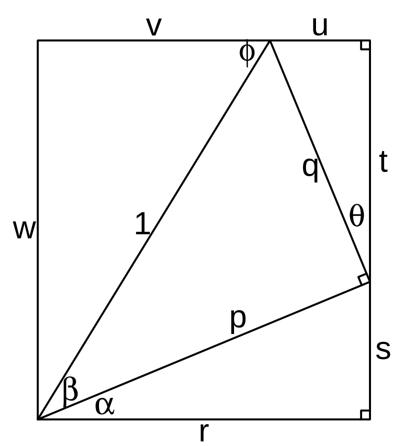
Question 6

Given $\cos(148°) \approx -0.85$, what is $\cos(74°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $148/2 = 74$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(60^\circ) = \frac{\sqrt{3}}{2} \qquad \sin(225^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(60^\circ) = \frac{1}{2} \qquad \cos(225^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\cos(285^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

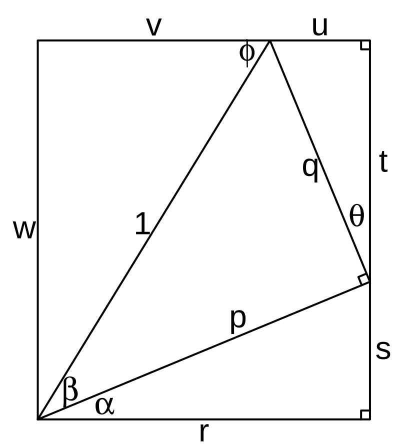
Question 6

Given $\cos(126°) \approx -0.59$, what is $\cos(63°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $126/2 = 63$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
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v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(60^\circ) = \frac{\sqrt{3}}{2} \qquad \sin(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(60^\circ) = \frac{1}{2} \qquad \cos(45^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\sin(15^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

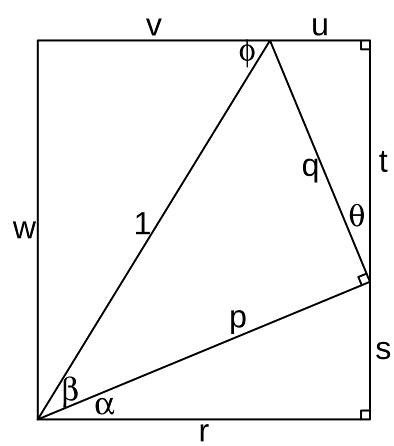
Question 6

Given $\cos(30°) \approx 0.87$, what is $\cos(15°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $30/2 = 15$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(330^\circ) = \frac{-1}{2}$$

$$\cos(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(330^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\cos(105^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

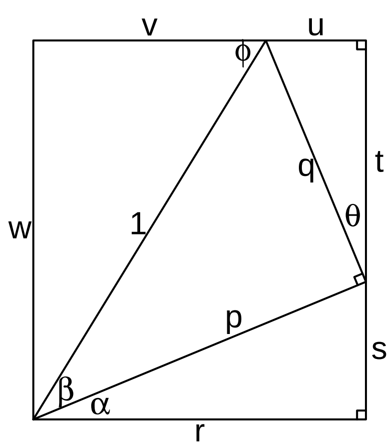
Question 6

Given $\cos(98°) \approx -0.14$, what is $\cos(49°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $98/2 = 49$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(120^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(120^\circ) = \frac{-1}{2}$$

Determine $\cos(165^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

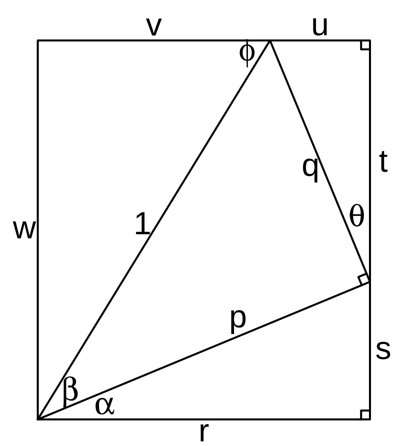
Question 6

Given $\cos(80°) \approx 0.17$, what is $\cos(40°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $80/2 = 40$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(135^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(330^\circ) = \frac{-1}{2}$$

$$\cos(135^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(330^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\cos(465^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

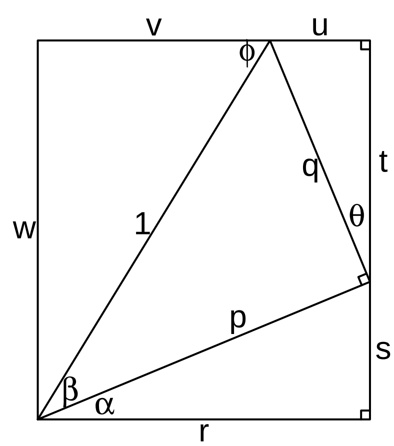
Question 6

Given $\cos(122°) \approx -0.53$, what is $\cos(61°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $122/2 = 61$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(30^\circ) = \frac{1}{2} \qquad \sin(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(30^\circ) = \frac{\sqrt{3}}{2} \qquad \cos(45^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\cos(75^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

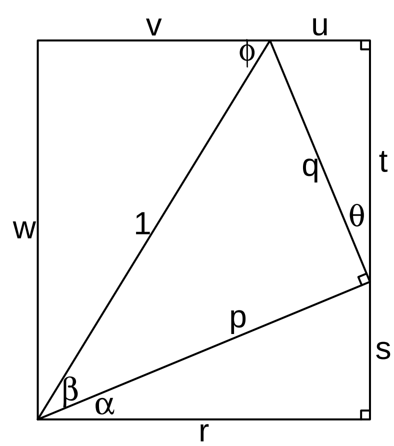
Question 6

Given $\cos(154°) \approx -0.9$, what is $\cos(77°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $154/2 = 77$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(150^\circ) = \frac{1}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(150^\circ) = \frac{-\sqrt{3}}{2}$$

Determine $\cos(195^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

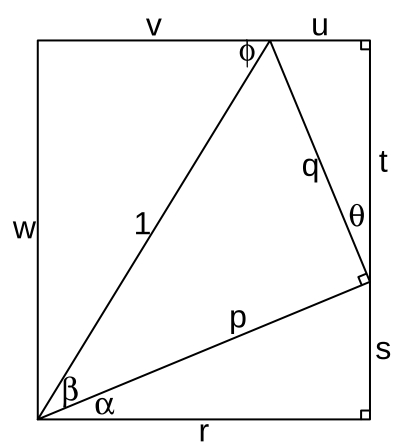
Question 6

Given $\cos(64°) \approx 0.44$, what is $\cos(32°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $64/2 = 32$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(300°) = \frac{-\sqrt{3}}{2} \qquad \sin(135°) = \frac{\sqrt{2}}{2}$$

$$\cos(300°) = \frac{1}{2} \qquad \cos(135°) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(-165°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

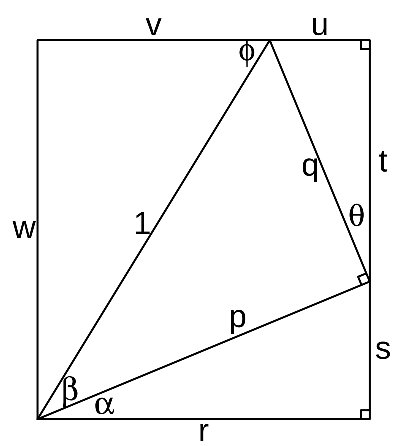
Question 6

Given $\cos(150°) \approx -0.87$, what is $\cos(75°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $150/2 = 75$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315°) = \frac{-\sqrt{2}}{2} \qquad \sin(60°) = \frac{\sqrt{3}}{2}$$

$$\cos(315°) = \frac{\sqrt{2}}{2} \qquad \cos(60°) = \frac{1}{2}$$

Determine $\sin(375°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

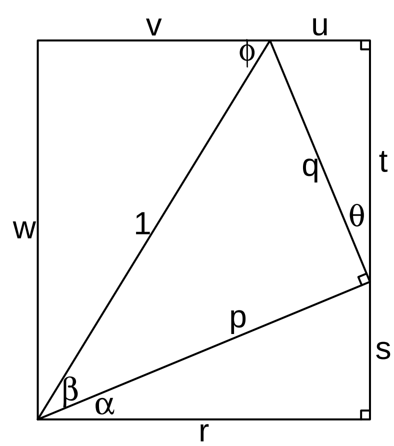
Question 6

Given $\cos(24°) \approx 0.91$, what is $\cos(12°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $24/2 = 12$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(135^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(300^\circ) = \frac{-\sqrt{3}}{2}$$

$$\cos(135^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(300^\circ) = \frac{1}{2}$$

Determine $\sin(165^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

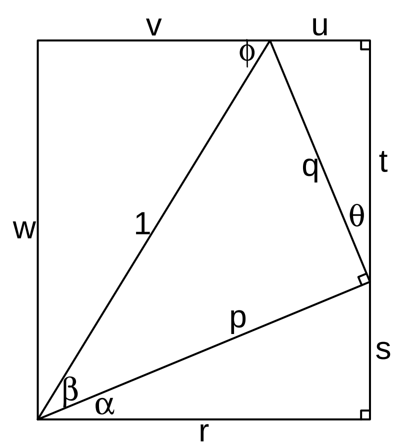
Question 6

Given $\cos(88°) \approx 0.03$, what is $\cos(44°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $88/2 = 44$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(210^\circ) = \frac{-1}{2} \qquad \sin(315^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(210^\circ) = \frac{-\sqrt{3}}{2} \qquad \cos(315^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\cos(105^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

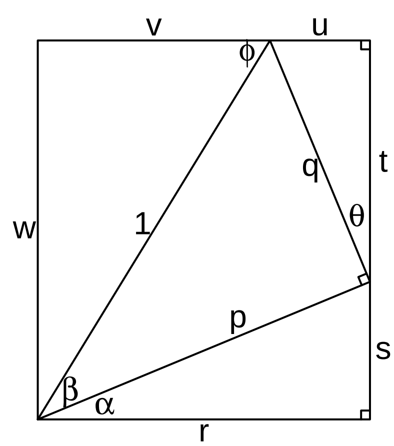
Question 6

Given $\cos(48°) \approx 0.67$, what is $\cos(24°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $48/2 = 24$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\sin(\alpha \pm \beta) = \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)$$
$$\cos(\alpha \pm \beta) = \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)$$

You know the following:

$$\sin(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(60^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(225^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(60^\circ) = \frac{1}{2}$$

Determine $\cos(165^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

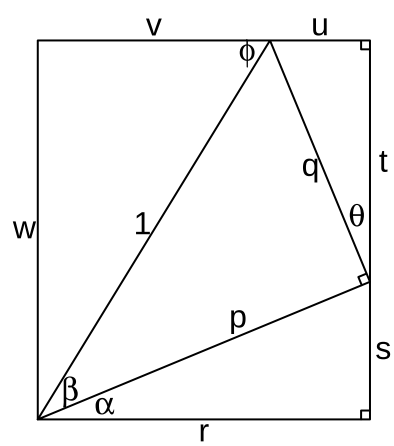
Question 6

Given $\cos(46°) \approx 0.69$, what is $\cos(23°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $46/2 = 23$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(300°) = \frac{-\sqrt{3}}{2} \qquad \sin(135°) = \frac{\sqrt{2}}{2}$$

$$\cos(300°) = \frac{1}{2} \qquad \cos(135°) = \frac{-\sqrt{2}}{2}$$

Determine $\cos(435°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

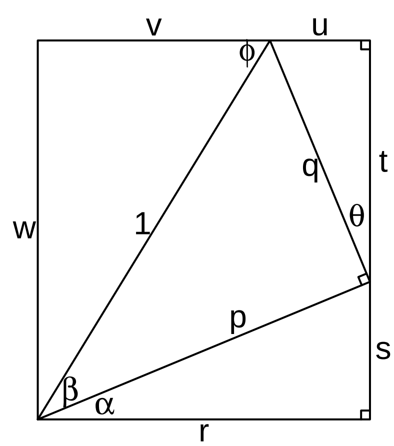
Question 6

Given $\cos(68°) \approx 0.37$, what is $\cos(34°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $68/2 = 34$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(120^\circ) = \frac{\sqrt{3}}{2} \qquad \sin(135^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(120^\circ) = \frac{-1}{2} \qquad \cos(135^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\cos(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

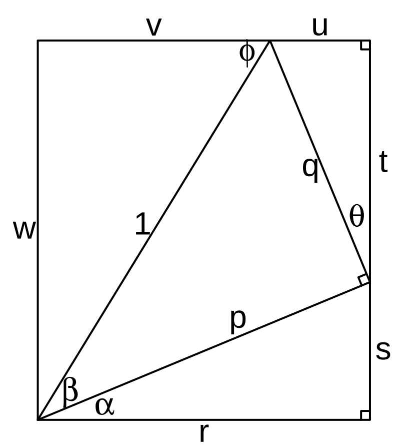
Question 6

Given $\cos(134°) \approx -0.69$, what is $\cos(67°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $134/2 = 67$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(30^\circ) = \frac{1}{2}$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(30^\circ) = \frac{\sqrt{3}}{2}$$

Determine $\sin(345^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

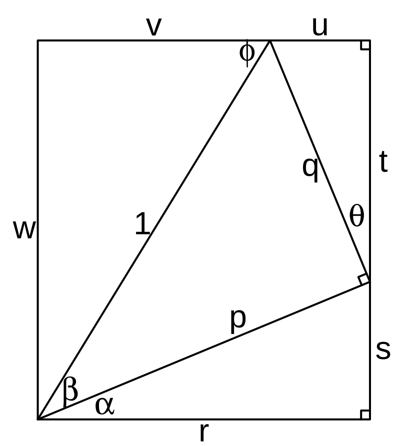
Question 6

Given $\cos(54°) \approx 0.59$, what is $\cos(27°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $54/2 = 27$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(135°) = \frac{\sqrt{2}}{2} \qquad \sin(210°) = \frac{-1}{2}$$

$$\cos(135°) = \frac{-\sqrt{2}}{2} \qquad \cos(210°) = \frac{-\sqrt{3}}{2}$$

Determine $\cos(75°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

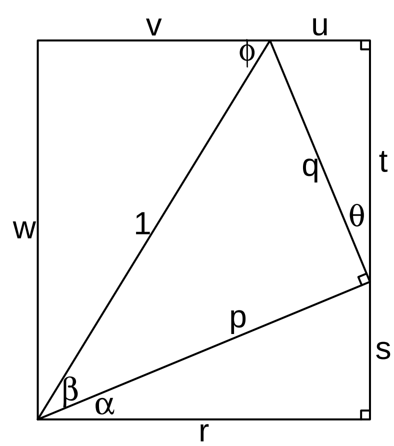
Question 6

Given $\cos(52^\circ) \approx 0.62$, what is $\cos(26^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $52/2 = 26$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\sin(\alpha \pm \beta) = \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)$$
$$\cos(\alpha \pm \beta) = \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)$$

You know the following:

$$\sin(150°) = \frac{1}{2} \qquad \sin(45°) = \frac{\sqrt{2}}{2}$$

$$\cos(150°) = \frac{-\sqrt{3}}{2} \qquad \cos(45°) = \frac{\sqrt{2}}{2}$$

Determine $\cos(195°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

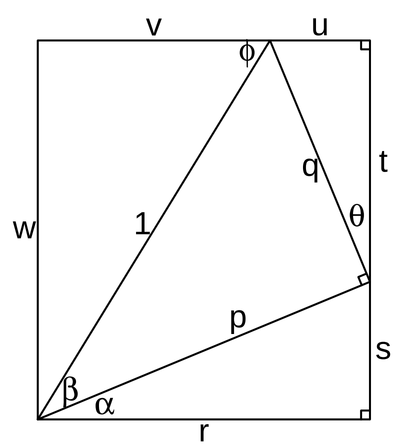
Question 6

Given $\cos(54^\circ) \approx 0.59$, what is $\cos(27^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $54/2 = 27$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(135^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(240^\circ) = \frac{-\sqrt{3}}{2}$$

$$\cos(135^\circ) = \frac{-\sqrt{2}}{2} \qquad \cos(240^\circ) = \frac{-1}{2}$$

Determine $\cos(-105^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

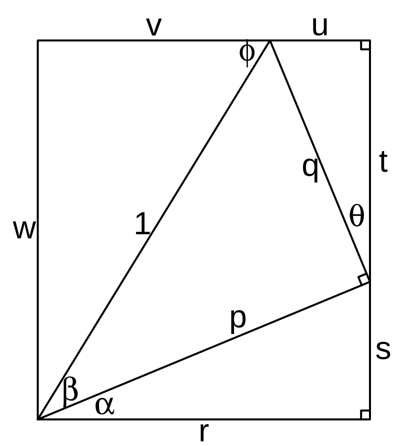
Question 6

Given $\cos(112°) \approx -0.37$, what is $\cos(56°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $112/2 = 56$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(240^\circ) = \frac{-\sqrt{3}}{2} \qquad \sin(135^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(240^\circ) = \frac{-1}{2} \qquad \cos(135^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(105^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

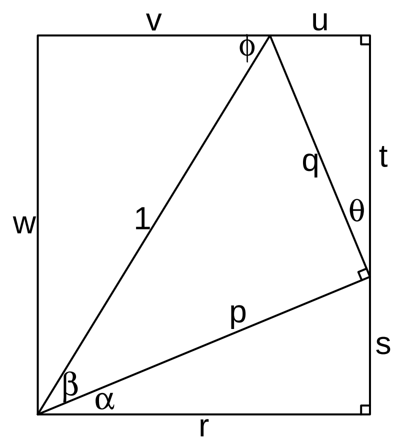
Question 6

Given $\cos(108^\circ) \approx -0.31$, what is $\cos(54^\circ)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $108/2 = 54$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
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t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(30°) = \frac{1}{2} \qquad \sin(225°) = \frac{-\sqrt{2}}{2}$$

$$\cos(30°) = \frac{\sqrt{3}}{2} \qquad \cos(225°) = \frac{-\sqrt{2}}{2}$$

Determine $\cos(195°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

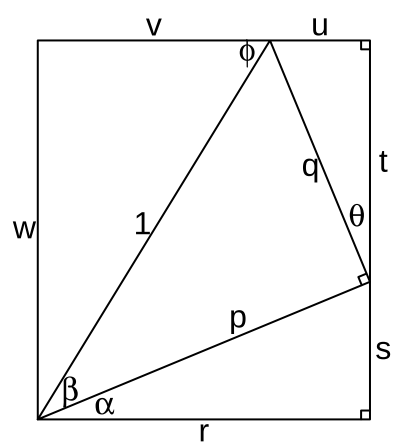
Question 6

Given $\cos(54°) \approx 0.59$, what is $\cos(27°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $54/2 = 27$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(300°) = \frac{-\sqrt{3}}{2} \qquad \sin(135°) = \frac{\sqrt{2}}{2}$$

$$\cos(300°) = \frac{1}{2} \qquad \cos(135°) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(165°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

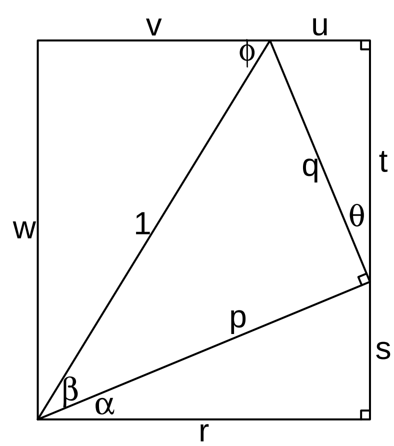
Question 6

Given $\cos(24°) \approx 0.91$, what is $\cos(12°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $24/2 = 12$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(30^\circ) = \frac{1}{2} \qquad \sin(225^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(30^\circ) = \frac{\sqrt{3}}{2} \qquad \cos(225^\circ) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(255^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

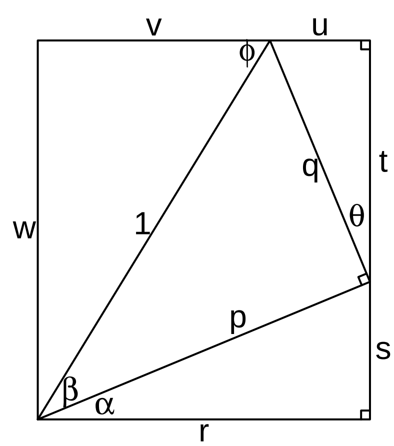
Question 6

Given $\cos(136°) \approx -0.72$, what is $\cos(68°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $136/2 = 68$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(240°) = \frac{-\sqrt{3}}{2} \qquad \sin(225°) = \frac{-\sqrt{2}}{2}$$

$$\cos(240°) = \frac{-1}{2} \qquad \cos(225°) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(465°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

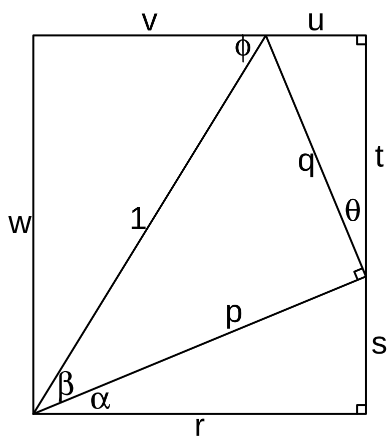
Question 6

Given $\cos(106°) \approx -0.28$, what is $\cos(53°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $106/2 = 53$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p\ =$	
$q\ =$	
$r\ =$	
$s\ =$	
$\theta\ =$	
$t\ =$	
$u\ =$	
$\phi\ =$	
$v\ =$	
$w\ =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)\\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(315^\circ) = \frac{-\sqrt{2}}{2} \qquad \sin(120^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(120^\circ) = \frac{-1}{2}$$

Determine $\cos(435^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

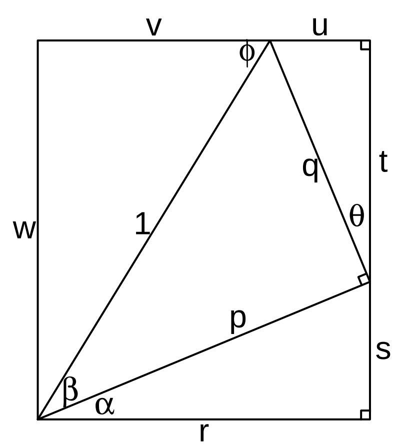
Question 6

Given $\cos(74°) \approx 0.28$, what is $\cos(37°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $74/2 = 37$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
$p =$	
$q =$	
$r =$	
$s =$	
$\theta =$	
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$u =$	
$\phi =$	
$v =$	
$w =$	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(60^\circ) = \frac{\sqrt{3}}{2} \qquad \sin(315^\circ) = \frac{-\sqrt{2}}{2}$$

$$\cos(60^\circ) = \frac{1}{2} \qquad \cos(315^\circ) = \frac{\sqrt{2}}{2}$$

Determine $\sin(375^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

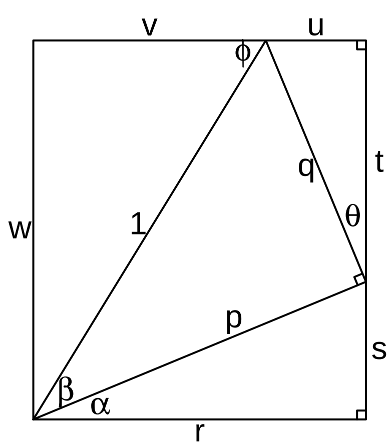
Question 6

Given $\cos(124°) \approx -0.56$, what is $\cos(62°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $124/2 = 62$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
p =	
q =	
r =	
s =	
θ =	
t =	
u =	
ϕ =	
v =	
w =	

Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned} \sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta) \end{aligned}$$

You know the following:

$$\sin(45^\circ) = \frac{\sqrt{2}}{2} \qquad \sin(60^\circ) = \frac{\sqrt{3}}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2} \qquad \cos(60^\circ) = \frac{1}{2}$$

Determine $\cos(15^\circ)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

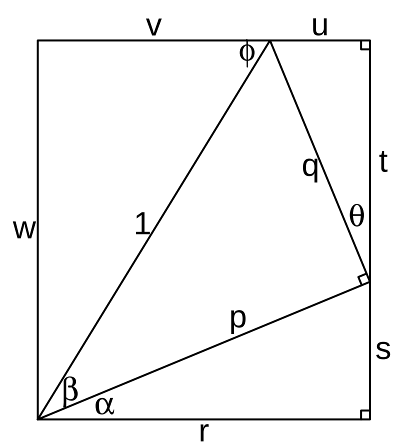
Question 6

Given $\cos(28°) \approx 0.88$, what is $\cos(14°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $28/2 = 14$.*)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



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$u\ =$	
$\phi\ =$	
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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(120°) = \frac{\sqrt{3}}{2} \qquad \sin(45°) = \frac{\sqrt{2}}{2}$$

$$\cos(120°) = \frac{-1}{2} \qquad \cos(45°) = \frac{\sqrt{2}}{2}$$

Determine $\sin(75°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

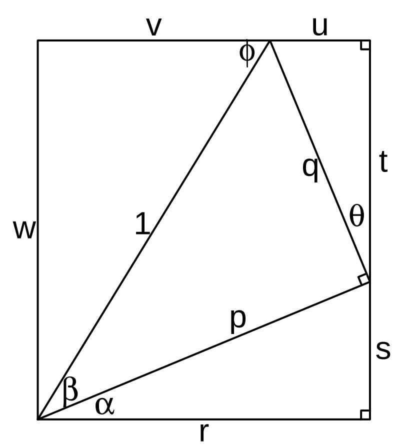
Question 6

Given $\cos(110°) \approx -0.34$, what is $\cos(55°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $110/2 = 55$*.)*

Question 1

In terms of α and β, express all the lengths and other angle measures (θ and ϕ).



Variable	Algebraic expression
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Question 2

The angle-sum and angle-difference identities are listed below:

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta) \\ \cos(\alpha \pm \beta) &= \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)\end{aligned}$$

You know the following:

$$\sin(210°) = \frac{-1}{2} \qquad \sin(135°) = \frac{\sqrt{2}}{2}$$

$$\cos(210°) = \frac{-\sqrt{3}}{2} \qquad \cos(135°) = \frac{-\sqrt{2}}{2}$$

Determine $\sin(345°)$ exactly.

Question 3

Prove the (sine) double-angle identity: $\sin(2x) = 2\sin(x)\cos(x)$

(Hint: start with an angle-sum formula from Question 2.)

Question 4

Prove the (cosine) double-angle identity: $\cos(2x) = 2\cos^2(x) - 1$

(Hint: start with an angle-sum formula from Question 2. Also, you will need to use the Pythagorean Identity: $\sin^2(x) + \cos^2(x) = 1$*)*

Question 5

Prove the (cosine) half-angle identity: $\cos\left(\frac{y}{2}\right) = \pm\sqrt{\frac{1+\cos(y)}{2}}$.

(Hint: start with the double-angle identity from Question 4.)

Question 6

Given $\cos(34°) \approx 0.83$, what is $\cos(17°)$? Please set up an expression, but do **not** try to simplify or evaluate a decimal approximation.

(Hint: $34/2 = 17$.*)*